

**RELOCKABLE, RECTANGULAR FOLDING BOX WITH LATERAL OPENING**

[0001] The invention relates to a relockable, rectangular folding box with four side panels, a bottom closure formed by two bottom closing flaps and two dust flaps, a closure formed by one or two closing flaps and two dust flaps, if necessary, a two-layer hanger formed by gluing together two hanging tabs, each tab containing a hanging arrangement, whereby one hanging tab is hinged to the top of one of the side panels and the other hanging tab is hinged to this hanging tab, an insertion tab is laterally hinged to a side panel, and one of the side panels features an area that is to be removed via a perforation, with the insertion tab being glued outside or inside to the perforated area.

[0002] German Patent Application DE P 39 32 441 discloses a relockable folding box, composed of a front and a rear side panel, as well as two side panels interconnecting the front and the rear side panels, a bottom panel, and an upper closing flap, with the closing flap being connected via a securing flap to an insertion tongue, which in turn is arranged via a breaking line in the rear or the front side panel, and can be removed therefrom. However, this folding box cannot be hung in any fashion on a hook.

[0003] Likewise, German Application DE P 43 22 555 discloses a relockable, rectangular folding box. This folding box comprises a rear side panel formed by an outer side panel part and an inner side panel part, a front side panel, two side panels interconnecting the front and the rear side panel, a bottom closure and an upper closure, with the outer side panel part having in its upper area a hanging tab with a correspondingly shaped hanging arrangement, such as, for example, a round or slotted hole. With the aid of the hanging tab, it is possible to place the folding box on a hook. However, since the hanging tab is embodied only in a single layer and made of the same material as the remaining folding box, problems arise with the use of the folding box in practice.

[0004] When the folding box is made of a thin material in consideration of environmental and cost aspects, the hanging tab will lack adequate stability. Even a slight, unintentional pulling on the folding box, will tear out the hanging tab, so that the hanging tab loses its

function, and the folding box can no longer be hung as desired. Moreover, the box becomes unsightly and can thus no longer be presented to the customer.

[0005] On the other hand, the manufacture of the folding box of a thicker, more stable material will mean that while the hanging tab can withstand much greater tensile forces, an unnecessarily large amount of material will also be wasted, since the other panels of the folding box are embodied to be overdimensioned.

[0006] A similar folding box is disclosed in DE 195 41 904. The folding box comprises a front side panel, a rear side panel, a right side panel interconnecting the front and the rear side panel, as well as a left side panel. The box includes a bottom closure formed by four bottom closing flaps, and an upper closure formed by four closing flaps, with two closing flaps of the upper closure and two bottom closing flaps being glued to one another. Furthermore, a tearing tab is integrated into the front or the rear side panel, which tearing tab is held in the front or the rear side panel by means of a weakened or predetermined breaking line, and which is connected via a folding line to a closing flap of the upper closure or to a bottom closing flap of the bottom closure. In the folding box, at least one inner rear panel is provided, namely when the tearing tab is located in the rear side panel. In the case that the tearing tab is located in the front side panel, an intermediate panel and, subsequent to the intermediate panel, an inner front panel will be hinged thereto.

[0007] A first hanging tab with a hanging arrangement, such as a slotted or round hole, which tab lies in a plane formed by the rear side panel, is hinged to the rear side panel in the area that is free of the tearing tab. From the same area of the inner rear panel as of the rear side panel, and proceeding from the folding line between inner rear panel and closing flap, a second hanging tab with a hanging arrangement, such as a slotted or round hole, is punched out at the same time, whereby the closing flap hinged to the inner rear panel has a greater width on the folding line than the second hanging tab.

[0008] DE 195 35 008 discloses a relockable, rectangular folding box, with a front side panel, a rear side panel, a left side panel interconnecting the front side panel and the rear

side panel, as well as a right side panel, a relockable bottom, preferably comprising three bottom closing flaps hinged to the side panels, and three further closing flaps which are hinged to the front left side panel interconnecting the front side panel and the rear side panel, and to the right side panel, and which are opposite the bottom closing flaps, as well as a fourth closing flap, which is hinged to the rear side panel, and which forms the upper closure of the folding box together with three further closing flaps, so that the folding box can be hung in a safe and reliable manner on the known self-service hooks of display shelves inside stores or pharmacies.

[0009] While this folding box includes a hanger embodied in two layers, it has no original closure that is relockable.

[0010] DE 198 21 087 discloses a relockable, rectangular folding box with a front side panel, a rear side panel, a right side panel interconnecting the front side panel and the rear side panel, as well as a left side panel, a bottom closure formed by four bottom closing flaps, and an upper closure formed by four closing flaps, whereby two closing flaps of the upper closure and two bottom closing flaps can be glued to one another, with a tearing tab integrated in the front or the rear side panel that is held in the front side panel or the rear side panel by means of a weakened or predetermined breaking line, and is connected via a folding line to a closing flap of the upper closure or to a bottom closing flap of the bottom closure, as well as with at least one inner rear side panel, hinged, if necessary, to an intermediate panel and, subsequent to the intermediate panel, to an inner front panel.

[0011] Furthermore, a tab is integrated in the front panel or the rear side panel by means of two weakened or predetermined breaking lines, and reversibly glued by means of at least one adhesive point.

[0012] EP 697 340 discloses a folding box of cardboard, wherein a hinge-type lid is embodied with a closing tab provided for a locking insertion into the box. To this end, a preformed slot is required in the cardboard, so that a dustproof packing and a simple relocking is not ensured.

[0013] Furthermore, all boxes known from the art have the disadvantage that, provided they have the original closure as disclosed in DE P 43 22 555, the hanger is always located on the side of the folding box opposite the original closure, i.e. in the bottom area of the folding box if the described folding boxes are boxes folded from a one-piece blank. A subsequent gluing of a hanger to the box is to be avoided at all times for the reasons stated above.

[0014] It is further disadvantageous that all folding boxes of the prior art use an unnecessarily large amount of material in order to ensure a hanger and a relockability at the same time.

[0015] Folding boxes are used as packaging and at the same time as advertisement media of the products to be sold therein. Packing costs, which include not only a simple automatic filling and gluing, but also the costs of material, must be as low as possible.

[0016] It is therefore an object of the present invention to create a folding box, which includes not only a stable hanging tab and a relockable closure, but can also be produced with low material expenditure. Furthermore, it is the object of the present invention to make available a folding box which can be put up, filled, and closed with the aid of machines simply and quickly, and whose folding blank including hanger and closure is made of a single piece.

[0017] A further object of the present invention is to make available a folding box with original closure, which box is not equipped with a hanging tab, and which represents an alternative to the known folding boxes, with the advantages of requiring only little material and having adequate stability at the same time.

[0018] This object of the invention is attained by the teaching of independent claims 1 and 2. Advantageous embodiments are defined in the dependent claims. Furthermore, the invention includes the punched blanks of the folding boxes according to the invention.

[0019] The folding box according to the invention comprises a front side panel, a rear side panel, as well as two side panels, a bottom closure formed by two bottom closing flaps and two dust flaps, a closure formed by one or two closing flaps and two dust flaps, if necessary, a two-layered hanger that is formed by gluing together two hanging tabs, which each include a hanging arrangement. In the embodiment with hanging tab, one hanging tab is hinged in one embodiment to the top of the front or the rear side panel, and a corresponding hanging tab is hinged to this hanging tab and glued thereto by being folded over. An insertion tab is laterally hinged to one of the narrow side panels, and the wide side panel features an area that is to be removed via a perforation, with the insertion tab being glued outside or inside to the perforated area.

[0020] The invention relates to a folding box raised on edge, preferably provided with a hinged, two-layered Euro tab, which has the opening area via the insertion tab on the side, either to the left or to the right respectively in the rear or in the front. During the gluing process in the manufacturing plant of the folding box, the insertion tab is glued to the face of the rear side or the front side of the folding box in the area of the perforated area. When the folding box is opened for the first time, the insertion tab is slightly pushed into the body. As a result, the perforated area glued to the insertion tab is removed from the rear or the front side. This gluing serves as original closure.

[0021] By gluing the tab surface outside to the front side area or the rear side area of the folding box, the original closure surface separated later is invisibly glued underneath to the insertion tab. After a relocking, it will become visible to every consumer that the folding box is no longer originally sealed.

[0022] However, the folding box may also be designed such that the perforated surface and the insertion tab are not glued to one another underneath, but that the perforated surface is glued underneath the insertion tab, i.e., inside. This variant has the advantage that the unbroken original closure, the perforated area, is clearly visible before the first opening, the theft protection is clearly identifiable, and a first opening is self-explanatory.

[0023] When the box is closed again, the dust flaps hinged to the insertion tab, and the insertion tab separated from the body are jointly inserted into the folding box. On the side to be inserted, the dust flaps have preferably rounded edges. These serve for a better insertion of the tab into the body of the folding box.

[0024] The preferred folding box with hanging arrangement is constructed in two different embodiments in the area of the hanging tab.

[0025] The two hanging tabs that are interconnected, folded over and glued together are preferably hinged to the long side of a cover surface. The cover surface thereby covers the underlying second cover surface only in part.

[0026] The embodiment in which the one hanging tab is hinged to the closing flap instead of directly to the other hanging tab is especially material-saving and advantageous.

[0027] It is obvious to one skilled in the art that interconnected parts of the folding box are preferably glued together, whereby common adhesive materials can be used. But in addition it is also possible to use other known connection means.

[0028] Exemplary embodiments of the folding box according to the invention are described in greater detail on the basis of the drawings 1 through 11.

- Fig. 1            shows the folding box blank of embodiment A with hanging arrangement;
- Fig. 2            shows the closing sequence during the gluing of the folding box;
- Fig. 3            shows the glued folding box with the hanger put upright;
- Fig. 4            shows the folding box blank of embodiment B with hanging arrangement;
- Fig. 5            shows the folding sequence (bending technique) in the area of the hanging tab;
- Fig. 6            shows the sequence that leads to the closing and gluing of the folding box and the tabs;

- Fig. 7 shows the folding box after the gluing, when the double hanging tab is mechanically put upright;
- Fig. 8 shows the relocking of the folding box after the first opening, whereby the separated breaking surface remains glued underneath the insertion tab;
- Fig. 9 shows the folding box (A) with the insertion surface glued underneath (inside);
- Fig. 10 shows the folding box blank of embodiment A without hanging arrangement;
- Fig. 11 shows the closing sequence during the gluing of the folding box without hanging arrangement.

[0029] Fig. 10 shows the folding box blank of embodiment A without hanging arrangement. The folding box is formed of front side panel (1), rear side panel (3), as well as two side panels (2, 4), laterally hinged to one another. Two bottom closing flaps (11, 31) are hinged to the bottom of side panels (1, 3) and two dust flaps (21, 41) to the narrow side panels (2, 4), which flaps form a bottom closure (20).

[0030] After the folding box has been put upright, the bottom surfaces (11, 31) are glued to one another, with the surfaces (21, 41) serving as dust shields.

[0031] Two closing flaps (12, 32) are hinged to the top of the side panel (1) and two dust flaps (22, 42) to the narrow side panels (2, 4), which flaps form the closure (30).

[0032] Preferably the dust flaps (41, 42) have edges (411, 421) rounded toward the side panel (1). They serve for a better insertion of the insertion tab when the folding box is closed again, as is accordingly shown in Fig. 8 for a folding box with hanger. This ensures a simplified closing of the folding box.

[0033] Fig. 11 shows the folding sequence for the gluing of the closure of embodiment A. To begin with, the closure surface (12) is folded inward, if necessary, it is glued to the

dust flap (22) (sequence 1), and finally the surface (32) is glued to the surface (12) folded inward that extends below it (sequence 2).

[0034] Fig. 1 shows the folding box blank of embodiment A with hanging arrangement. The finished folding box thereof is shown in Fig. 9.

[0035] The folding box is formed of front side panel (1), rear side panel (3), as well as two side panels (2, 4), laterally hinged to one another. Two bottom closing flaps (11, 31) are hinged to the bottom of the side panels (1, 3) and two dust flaps (21, 41) to the narrow side panels (2, 4), which flaps form a bottom closure (20).

[0036] After the folding box has been put upright, the bottom surfaces (11, 31) are glued to one another, with the surfaces (21, 41) serving as dust shields.

[0037] One closing flap (12) is hinged to the top of the side panel (1) and two dust flaps (22, 42) are hinged to the narrow side panels (2, 4), which flaps form the closure (30).

[0038] Preferably the dust flaps (41, 42) have edges (411, 421) rounded toward the side panel (1). They serve for a better insertion of the insertion tab, when the folding box is closed again, as shown in Fig. 8. This ensures a simplified closing of the folding box.

[0039] A hanging tab (33) is hinged to the top of the rear side panel (3) via a cover flap (32) (embodiment A). However, it is also possible to hinge the hanging tab (33) to the side panel (3) directly, i.e., without cover flap (32).

[0040] A second hanging tab (34) is hinged to the hanging tab (33), whereby respectively one hanging attachment (37) is present.

[0041] The two hanging tabs (33, 34) that are connected, folded over, and glued together are hinged to the long side of the cover surface (32). The cover surface covers the closing flap (12) lying below it only in part, since a hanger (50) should be located, if possible, in



the center (Fig. 3). Because of the gluing process, it will be better with very narrow folding boxes if the front cover surface (32) is made somewhat wider than half the width of the folding box, so that the hanger is located slightly offset from the center.

[0042] Preferably, the cover surface (32) has therefore at least half the width, preferably a width in the range of 0.55 to 0.6 of the closing flap (12).

[0043] As a result, the hanger is in the center (width 0.5 of the flap (12)), at the edge of the side panel (1) (width about 1 of the flap (12)), or at the edge of the side panel (3) (width about 0.1 of the flap (12)). If the width of the cover surface (32) is the same as that of the flap (12), the hanger will be located in the extension of the side panel (1). If the width of the cover surface (32) equals 0, an embodiment will result, in which the hanging tab (33) is directly hinged to the side panel (3), and in which the hanger is therefore positioned on the side panel (3).

[0044] Fig. 2 shows the folding sequence for the gluing of the closure of embodiment A. To begin with, the flap surfaces (33+34) are glued together (sequence 1). Subsequently, the closing surface (12) is folded inward, if necessary, glued to the dust flap (22) (sequence 2), and finally the surface (32) is glued to the surface (12) folded inward, extending below it (sequence 3).

[0045] For one skilled in the art it is obvious and self-explanatory that the descriptions given for the front side panel apply in a corresponding manner to the rear side panel.

[0046] An insertion tab (5) is laterally hinged to the side panel (4) of the folding box according to the invention, and the side panel (1) features an area (13) that is to be removed via a perforation (113). On its lateral surface (4), the folding box blank has the insertion tab (5). During the gluing process in the manufacturing plant of the folding box, the insertion tab (5) is glued to the surface (13) that is removable from the surface (1) via a perforation (113).

[0047] The hanging tab arrangement shown in Figs. 4 through 8 is especially material-saving and advantageous.

[0048] Fig. 4 thereby shows the folding box blank of embodiment B. Unlike embodiment A (Fig. 1), the hanging tab (34) is hinged to the closing flap (12) instead of to the tab (33).

[0049] Figs. 5, 6, and 7 show the closing sequence. The tab area is thus constructed such that it becomes two-layered by the gluing process in the cartonizer, after products have been filled into the folding box. During the closing in the packaging line, the cartonizer first folds the tab surface (33) outward, as shown in Fig. 5 (step 1). Thereafter, the closing flap (12) and the hanging tab (34) hinged thereto are folded over (Fig. 6, step 2). Finally, the tab (33) is put upright and glued to the tab (34) to form the hanger (50).

[0050] In its punched-out shape, the rear tab surface (33) must be somewhat smaller in its outside dimensions, so that the rear tab blank cannot show in front. However, the hanging hole, also named Euro hole, should be cut somewhat larger in its contour, so that it does not show in front either.

[0051] In the case of this tab construction, the sequence that leads to the closing of the folding box and to the gluing of both hanging tabs is decisive.

[0052] As shown in Fig. 8, the folding box is opened by tearing off the surface (13) via the tab (5) that is glued to it.

[0053] The relocking occurs by jointly inserting the insertion tab (5) and the dust flaps (41, 42).

[0054] As a result of their simple construction, both folding box variants A and B achieve an optimal use of the packaging material and, simultaneously, a simple manufacturing in the production lines.

[0055] Advantageously, it is possible to change the blank in the manufacturing plant of the folding box in terms of gluing such that the surface (13) is not glued underneath the surface (5), but that the surface (5) is glued underneath the surface (13). This means, that the tab (5) can be glued to the area (13) outside or from the inside. The latter variant has the advantage that the unbroken original closure is clearly visible before the first opening, that the theft protection is clearly identifiable, and that a first opening is self-explanatory (Fig. 9).

[0056] The integration of the hanger into the folding box blank of the folding box makes it possible to complete the manufacture of the folding box within one process step. A subsequent and thus unnecessarily expensive gluing of a hanger is not needed.

[0057] With the exception of the hanger and the provided gluing points, the folding box according to the invention is made in a single layer and thus meets the requirement of material minimization. Moreover, the folding box according to the invention is machine-compatible, i.e., it can be glued in a fully automated manner from one punched blank. In this manner, a dustproof and relockable packaging for the products inside the folding box is obtained.

[0058] The front and back sides of the folding box present excellent design possibilities. After the folding box has been put up and filled, it can be glued in a simple manner. This gluing provides a good protection against dust, so that a subsequent overwrap or an additional packing of the folding box becomes unnecessary. The folding box is glued, dustproof, originally closed, and relockable; it is easy to handle and variable in its design. A processing without problems is possible. Furthermore, the folding box is environmentally protective and produced from a folding blank with the use of a minimum amount of material.

[0059] Preferably the hanger is hinged such that a hanging in the center is ensured when the packaging is closed and glued. This has the advantage that the folding box can be hung just right when it is hung in a shelving system.

[0060] The folding box according to the invention enables a hanging in shelving systems and a lateral product removal without damaging the hanger.